Gases

1\. a. $D = \frac{MP}{RT}$ $M = \frac{DRT}{P} = \frac{(3.53\frac{g}{L})(0.08206\frac{L\cdot atm}{mol\cdot K})(27°C + 273K)}{\left(\frac{750\,mmHg}{760\,mmHg}\right)}$

$= \boxed{88.1\frac{g}{mol}}$

b

X $1.00\,mol \times 88.1\frac{g}{mol} \times \frac{0.648\,g\,Q}{1.00\,g\,X} = 57.1\,g\,Q$

Y $1.00\,mol \times 104\frac{g}{mol} \times \frac{0.730\,g\,Q}{1.00\,g\,Y} = 75.9\,g\,Q$

Z $1.00\,mol \times 64.0\frac{g}{mol} \times \frac{0.593\,g\,Q}{1.00\,g\,Z} = 38.0\,g\,Q$

c ~~0.648 (x) + 0.648(y) = 88.9 g/mol~~

~~Q + Rest = 88.1 g/mol~~

19 × 3 57.1 g Q

19 × 4 75.9 g Q

19 × 2 38.0 g Q

} 19 is common multiple Q is most likely F

Mean

d ≥ 1.00g

$$1.37\,g\,CO_2 \times \frac{1\,mol\,CO_2}{44.0\,g\,CO_2} \times \frac{1\,mol\,C}{1\,mol\,CO_2} = 0.0311\,mol\,C \times \frac{12.0\,g\,C}{1\,mol\,C} = 0.374\,g\,C$$

$$0.281\,g\,H_2O \times \frac{1\,mol\,H_2O}{18.0\,g\,H_2O} \times \frac{2\,mol\,H}{1\,mol\,H_2O} = 0.0312\,mol\,H \times \frac{1.00\,g\,H}{1\,mol\,H} = 0.0312\,g$$

$$1.00\,g - 0.374\,g\,C - 0.0312\,g\,H = 0.595\,g\,F \times \frac{1\,mol\,F}{19.0\,g\,F} = 0.0313\,mol\,F$$

"Q"

0.0311 mol C 0.0312 mol H 0.0313 mol F

0.0311 mol

CHF = 32 g/mol

$C_2H_2F_2$ = 64 g/mol) x2

2 a CO_2 b/c all balloon contain same # of molecules at this T + P and since CO_2 molecules have the highest molar mass they will have the highest mass

b The gas all equal $(KE)_{avg} = \frac{3}{2}RT$ since T is the same the gases are moving @ the same speed.

c CO_2 Even though its nonpolar it will have the highest London forces so ~~there is~~ there will be greater attraction for each particle on each other.

d He has the smallest particles (single atom) so these particles can pass through the latex container walls easier